

LISTING OF CLAIMS

These claims replace all previous versions of claims in the application:

1. (Cancelled).

2. (Cancelled).

3. (Withdrawn) The process according to Claim 1, wherein said co-surfactants are selected from the group consisting of alkyl acid phosphates, alkyl acid sulfonates, alkyl alcohols, substituted alkyl alcohols, perfluoroalkyl alcohols, dialkyl sulfosuccinates, bis-(2-ethyl-hexyl) sulfosuccinates, AOT, salts thereof, and combinations thereof.

4. (Cancelled).

5. (Withdrawn) The process according to Claim 1, further comprising the step of rinsing said substrate with a densified fluid comprising up to about 30% modifiers by volume.

6. (Withdrawn) The process according to Claim 5, wherein said densified fluid is a pure densified fluid absent any added modifiers.

7. (Withdrawn) The process according to Claim 5, wherein said densified fluid is a

mixture of densified CO₂ and a modifier selected from the group consisting of isopropyl alcohol, H₂O, methanol, ethanol, and combinations thereof.

8. (Withdrawn) The process according to Claim 7, wherein said densified fluid comprises up to about 15% by volume isopropyl alcohol.

Claims 9-11 (Cancelled).

12. (Withdrawn) The process according to Claim 1, wherein said reactive cleaning fluid has a temperature and pressure above the critical temperature and critical pressure of said densified fluid.

Claims 13-15 (Cancelled).

16. (Withdrawn) The process according to Claim 14, wherein said cationic reverse-micelle forming surfactant is selected from the tetraoctylammonium fluoride class of compounds.

17. (Withdrawn) The process according to Claim 14, wherein said non-ionic reverse-micelle forming surfactant is selected from the poly-ethyleneoxide-dodecyl-ether class of compounds.

18. (Withdrawn) The process according to Claim 14, wherein said zwitterionic reverse-micelle forming surfactant is selected from the alpha-phosphatidyl-choline class of compounds.

19. (Withdrawn) The process of Claim 1, wherein said reactive chemical agent is selected from the group consisting of mineral acids, fluoride-containing compounds and acids, organic acids, oxygen-containing compounds, amines, alkanolamines, peroxides, chelates, ammonia, and combinations thereof.

20. (Withdrawn) The process according to Claim 19, wherein said mineral acids are selected from the group consisting of HCl, H₂SO₄, H₃PO₄, HNO₃, HSO₄⁻, H₂PO₄, HPO₄²⁻, phosphate acids, acid sulfonates, dissolution products thereof, salts thereof, and combinations thereof.

21. (Withdrawn) The process according to Claim 19, wherein said fluoride-containing compounds and acids are selected from the group consisting of F₂, HF, dilute HF, ultra-dilute HF, and combinations thereof.

22. (Withdrawn) The process according to Claim 19, wherein said organic acids are selected from the group consisting of sulfonic acids, phosphate acids, phosphate esters

or their salts, substituted derivatives thereof, and combinations thereof.

23. (Withdrawn) The process according to Claim 19, wherein said oxygen-containing compounds are selected from the group consisting of O₂, ozone, and combinations thereof.

Claims 24-25 (Cancelled).

26. (Withdrawn) The process according to Claim 19, wherein said chelating agent is selected from the group consisting of pentanediones; 2,4 pentanediones; phenanthrolines; 1,10 phenanthroline; EDTA, sodium EDTA, oxalic acid, and combinations thereof.

27. (Withdrawn) The process according to Claim 19, wherein said peroxides are selected from the group consisting of organic peroxides, alkyl peroxides, t-butyl peroxides, hydrogen peroxide, substituted derivatives, and combinations thereof.

28. (Cancelled).

29. (Withdrawn) The process in accordance with Claim 28, wherein said reactive cleaning fluid comprises from about 2% to about 5% modifiers by volume selected from

the group consisting of PFPE acid phosphates, AOT, salts thereof, H₂O, and combinations thereof.

30. (Cancelled).

31. (Withdrawn) The process in accordance with Claim 28, wherein said reactive cleaning fluid further comprises a corrosion inhibitor having a concentration in the range from about 0.1% to about 1% by volume.

32. (Withdrawn) The process in accordance with Claim 31, wherein said corrosion inhibitor is selected from the group consisting of benzotriazoles; 1,2,3-benzotriazole; catechols; catechol; 1,2-di-hydroxy-benzene; 2-(3,4-di-hydroxy-phenyl)-3,4-di-hydro-2H-1-benzopyran-3,5,7-triol, substituted derivatives thereof, and combinations thereof.

Claims 33-39 (Cancelled).

40. (Withdrawn) The process of Claim 1, wherein contacting of said residue with said reactive cleaning fluid is preceded by etching of said substrate.

41. (Cancelled).

42. (Withdrawn) The process of Claim 41, wherein manufacturing of said substrate or wafer further comprises a processing step selected from the group consisting of etching, residue removing, cleaning, transferring, rinsing, depositing, and combinations thereof.

43. (Withdrawn) The process of Claim 42, wherein said transferring comprises moving said substrate or wafer with a transfer system or device during manufacturing of said wafer.

44. (Withdrawn) The process of Claim 42, wherein depositing comprises deposition of a material to said substrate or wafer selected from the group consisting of metals, non-metals, silicon, films and layers thereof, or combinations thereof.

Claims 45-49 (Cancelled).

50. (New) A process for removing a residue from a surface, comprising the steps of:
mixing a densified fluid with at least one reverse-micelle-forming surfactant and at least one chemical reagent;

wherein said at least one surfactant and said at least one reagent in said densified fluid form a plurality of reactive reverse-micelles operable for removing said residue;

contacting said residue with said fluid containing said reactive reverse-micelles;
and

wherein said residue is chemically removed from said surface by action of said reactive reverse-micelles in said fluid.

51. (New) The process according to Claim 50, wherein said densified fluid comprises a member selected from the group consisting of carbon dioxide, chlorodifluoromethane, ethane, ethylene, propane, butane, sulfur hexafluoride, ammonia, and combinations thereof.

52. (New) The process according to Claim 51, wherein said densified fluid is a densified fluid comprising CO₂ having a temperature in the range from about 20 °C to about 25 °C, a pressure in the range from about 850 psi to about 3000 psi, and a density above the critical density of CO₂.

53. (New) The process according to Claim 52, wherein said density of said fluid is a reduced density for CO₂ selected in the range from about 1 to about 3.

54. (New) The process according to Claim 53, wherein said at least one surfactant includes a CO₂-philic surfactant and a non-CO₂-philic surfactant.

55. (New) The process according to Claim 53, wherein said at least one reverse micelle forming surfactant is selected from the group consisting of anionic surfactants, cationic

surfactants, non-ionic surfactants, zwitterionic surfactants, and combinations thereof.

56. (New) The process according to Claim 55, wherein said anionic reverse-micelle forming surfactant is selected from the group consisting of PFPE surfactants, PFPE carboxylates, PFPE sulfonates, PFPE phosphates, alkyl sulfonates, bis-(2-ethyl-hexyl) sulfosuccinates, sodium bis-(2-ethyl-hexyl) sulfosuccinates, ammonium bis-(2-ethyl-hexyl) sulfosuccinates, fluorocarbon carboxylates, fluorocarbon phosphates, fluorocarbon sulfonates, and combinations thereof.

57. (New) The process according to Claim 56, wherein said at least one reagent is selected from the group consisting of alkanolamines, hydroxylamine, H₂O, and combinations thereof.

58. (New) The process according to Claim 57, wherein said alkanolamine is ethanolamine.

59. (New) The process according to Claim 57, wherein said at least one reagent has a concentration of up to about 30% by volume in said fluid.

60. (New) The process according to Claim 57, wherein said at least one reagent has a concentration in the range from about 2% to about 5% by volume in said fluid.

61. (New) The process according to Claim 57, wherein the step of mixing further includes adding about 5% by volume of a modifier selected from the group consisting of amines, alkylamines, benzotriazoles, catechols, and combinations thereof.

62. (New) The process according to Claim 50, wherein said residue is selected from the group consisting of organic residues, metal residues, etch residues, non-metal residues, polymeric residues, and combinations thereof.

63. (New) The process according to Claim 50, wherein said residue is a transition metal.

64. (New) The process according to Claim 50, wherein said residue is a metal-containing residue.

65. (New) The process according to Claim 50, wherein said residue is a metal selected from the group consisting of Cu, Al, Fe, Ta, and combinations thereof.

66. (New) The process according to Claim 50, wherein said residue is a silicon-containing residue.

67. (New) The process according to Claim 50, wherein said residue is an etch residue.

68. (New) The process according to Claim 50, wherein said process is utilized in the process of manufacturing of a semiconductor substrate.

69. (New) The process according to Claim 50, wherein the step of contacting said residue with said fluid includes applying a predetermined quantity of said fluid with a fluid delivery system or device.

70. (New) The process according to Claim 50, wherein said surface is a semiconductor surface or substrate.

REMARKS

Claims 1 and 3-45 are pending in the application. Claims 3, 5-8, 12, 16-18, 20-23, 26-27, 29, 31-32, 40, and 42-44 are withdrawn from consideration by the Examiner. Claims 46- 49 drawn to apparatus, are cancelled by Applicant without prejudice in favor of consideration in a separate divisional.

Further:

1. In order to simplify claims of the elected species and move prosecution of the application forward, old Claims 1-2, 4, 9-11, 13-15, 24-25, 28, 30, 33-39, 41, and 45 are cancelled and New Claims 50-70 are added.

2. New claims find support in the application as filed, in particular:

- New Claim 50 finds support, e.g., in paragraph [0008] and original claims 1-2.
- New Claim 51 finds support, e.g., in paragraph [0011] and original claim 13.
- New Claim 52 finds support, e.g., in paragraph [0014] and original claim 9.
- New Claim 53 finds support, e.g., in paragraph [0010] and original claim 11.
- New Claim 54 finds support, e.g., in original claim 4.
- New Claim 55 finds support, e.g., in paragraph [0016] and original claim 14.

- New Claim 56 finds support, e.g., in paragraph [0016] and original claim 15.
- New Claim 57 finds support, e.g., in paragraphs [0017] and [0063] and original claim 30.
- New Claim 58 finds support, e.g., in paragraph [0017] and original claim 24.
- New Claim 59 finds support, e.g., in paragraph [0069] and original claim 28.
- New Claim 60 finds support, e.g., in paragraph [0069] and original claim 30.
- New Claim 61 finds support, e.g., in paragraph [0018] and original claim 33.
- New Claim 62 finds support, e.g., in paragraph [0006] and original claim 36.
- New Claim 63 finds support, e.g., in paragraph [0003] and original claim 37.
- New Claim 64 finds support, e.g., in paragraph [0003].
- New Claim 65 finds support, e.g., in paragraphs [0001] and [0003] and original claim 38.
- New Claim 66 finds support, e.g., in paragraph [0003].
- New Claim 67 finds support, e.g., in paragraph [0001] and original claim 36.
- New Claim 68 finds support, e.g., in paragraph [0003].
- New Claim 69 finds support, e.g., in paragraph [0069].
- New Claim 70 finds support, e.g., in paragraph [0005] and original claim 1.

3. As such, none of these claims add any new matter to the specification and entry and acceptance of these claims is respectfully requested.